

LAND DISPOSAL RESTRICTION
FEDERAL FACILITY COMPLIANCE AGREEMENT
ROCKY FLATS PLANT

PROJECT MANAGER'S MEETING MINUTES

Meeting Date: February 10, 1994
Meeting Location: Third Floor Conference Room, Building 051
EG&G Rocky Flats, Inc., Denver West

The meeting was convened at 1:10 p.m.

INTRODUCTIONS:

The following personnel and organizations were represented at the meeting:

Cathy Alstatt	Colorado Department of Health (CDH)
Fred Dowsett	CDH
Dave Maxwell	Environmental Protection Agency Region VIII (EPA)
Rick DiSalvo	Department of Energy (DOE), Rocky Flats Office (RFO) - Waste Management Division (WMD)
Reg Tyler	RFO, Transuranic (TRU) Waste Management Division (TWMD)
Sherri Rudolph	RFO, Assistant Manager Operation and Waste Management (AMOWM), Technical Program Officer (TPO)
Robin Sweeney	DOE, Headquarters (HQ), EM-323
Bob Karlsson	SAIC/EM-323, DOE, HQ
Scott Anderson	EG&G, Federal Facilities Compliance Agreement (FFCA) Programs
Pat Arnold	EG&G, Radioactive Waste Programs (RWP)
Michael Connell	EG&G, Technology Development (TD), Waste Projects (WP)
Sandy Day	EG&G, FFCA Programs
Kent Dorr	EG&G, Facilities Project Management (FPM)
Don Ferrier	EG&G, Solar Ponds Remediation Project
Ernest Garcia	EG&G, TD
Joe McKaig	EG&G, FFCA Programs
Tim McKeown	EG&G, FFCA Programs
Scott Miya	EG&G, FFCA Programs
Gerald A. O'Leary	EG&G, RWP
Dave Phillips	EG&G, TD
Denny Weier	EG&G, Statistical Applications
Geoff Asmus	S. M. Stoller Corporation

The list of attendee signatures is provided as Attachment 1. D. Ferrier was inadvertently omitted from the signature list.

AGENDA:

The agenda for the meeting is provided as Attachment 2.

MEETING DISCUSSION:

ACTIONS FROM JANUARY LDR FFCA II PROJECT MANAGER'S MEETING:

- *STATUS OF COMPREHENSIVE TREATMENT AND MANAGEMENT PLAN (CTMP) TREATMENT SYSTEM 6 - SOLAR POND CLEANOUT* - R. DiSalvo, RFO, opened the meeting by introducing Don Ferrier as the EG&G representative for the Solar Ponds Remediation Project (SPRP). The purpose of the presentation was to describe the planned activities for CTMP Treatment System 6, given that the Halliburton (HNUS) process equipment had been dismantled and removed from plant site, including the plans for reprocessing non-land disposal restriction (LDR) compliant portions of solidified saltcrete and pondcrete currently in storage at Rocky Flats Plant (RFP).

EG&G presented the status of the Solar Pond Processing Project (Attachment 3). Pond sludge is currently being pumped out of the solar ponds and into storage tanks located on the 750 pad. There is a need to remove the sludge from the ponds in order to perform site characterization of Operable Unit (OU) 4. Sample results from HNUS were presented for pond sludge, pondcrete, and saltcrete. CDH inquired as to the origin of the methanol in the pondcrete samples. EG&G stated that this has not been determined and that this may be an erroneous result.

A process control plan is currently being developed for a process that will produce a certifiable waste product from the pond sludge that will meet both LDR standards and Nevada Test Site (NTS) waste acceptance criteria (WAC). EG&G noted that it is anticipated that fifty percent waste loading for the cementation process was achievable while still producing a certifiable and compliant final waste form.

The reprocessing of pondcrete and saltcrete is complicated by the fact that the containers for these wastes may also have to be immobilized. This will include the wood, plastic, and metal that are parts of these containers. Due to these complications, waste loading for the remixing process for the existing pondcrete and saltcrete monoliths has not been determined. In addition, the SPRP is currently investigating the use of alternative solidification technologies besides cementation for these waste forms.

CDH inquired why there was a need to redesign the pond sludge processing system and to add years to the processing schedule when the HNUS system design was nearly complete. RFO responded that the HNUS system was designed for high

throughput to meet a schedule for solar pond clean out that has since been revised. While the HNUS system focused on the pond sludge solidification, a remix design to reprocess non-compliant pondcrete and saltcrete was not fully developed. CDH inquired what the similarities, if any, existed between a pond sludge processing system design and a system configured to reprocess saltcrete and pondcrete. EG&G responded by describing some of the potential synergies between the mixing and size reduction equipment design that could exist between the two processes. CDH stated that the solar pond sludge was the largest volume non-compliant waste forms on plant site and is a major LDR waste management issue. CDH also remarked that it is not acceptable for RFP to wait until a Record Of Decision (ROD) has been reached for OU 4 prior to resolving the pond sludge issue. In addition, CDH expressed concern over the length of time it is taken to develop and implement an effective strategy that will achieve LDR compliance by treatment of pond sludge when similar waste sludges are managed and treated by commercial waste treatment facilities every day. EG&G pointed out that the primary reason for a delay in processing sludge is that there is no present option for disposal and that it is presumed better to wait until processed wastes could be shipped for disposal before processing. RFP stated that Envirocare of Utah, Inc. (Envirocare) has been identified as a properly licensed potential disposal site, and that steps are being taken to gain approval for RFP wastes at Envirocare.

- *TRANSURANIC MIXED (TRM) WASTE CHARACTERIZATION - GAS GENERATION STUDIES* - P. Arnold, EG&G, presented the procedures necessary to certify TRM wastes for shipment in Transuranic Package Transporter (TRUPACT-II) vessels (Attachment 4), specifically regarding the gas generation requirements contained in the TRUPACT-II Safety Analysis Report (SAR) ¹. CDH inquired what types of analysis are associated with the procedure. EG&G stated that a headspace analysis is expected to be conducted prior to the test, during which 9 inorganic compounds and 29 organic compounds are analyzed. During the procedure, the 9 inorganic compounds are monitored. F. Dowsett, CDH, stated that the gas generation studies and test procedures did not meet the definition of treatment under the terms of the Resource Conservation and Recovery Act (RCRA).

- *LISTING OF TRM ITEM DESCRIPTION CODES (IDCS) WHICH HAVE BEEN SUBMITTED FOR APPROVAL TO THE TRUCON DOCUMENT* - G. O'Leary, EG&G, presented a table of information regarding the status of TRM IDCs with respect to their

¹ NuPac, "Safety Analysis Report for the TRUPACT-II Shipping Package," Revision 4, Nuclear Packaging, Inc., Federal Way, Washington, 1989

inclusion in the TRUPACT-II Content Codes (TRUCON) ² document (Attachment 5). When an IDC is included in the TRUCON document, it is assigned a TRUCON code. This code allows for the shipment of the IDC in a TRUPACT-II vessel. Several IDCs were submitted in early January of 1994 to the Waste Isolation Pilot Plant (WIPP) for inclusion in the document. Some IDCs are not in the document or are not currently submitted for inclusion for various reasons. These reasons may include that some of the TRM IDCs are classified shapes (not acceptable at WIPP), or through process knowledge it has been determined that they may not meet the WIPP Waste Acceptance Criteria (WAC) and require treatment or analysis to determine if they may be shipped to WIPP. Some IDCs will be changed into different IDCs after plant procedures are completed and are therefore not submitted under their initial IDC designation for inclusion into the TRUCON document.

WASTE CHARACTERIZATION :

- *BACKLOG SALTCRETE RECHARACTERIZATION INFORMATION* - E. Garcia, EG&G, presented the evaluation of the saltcrete analytical data generated by HNUS (Attachment 6). The objective is to use the existing HNUS data to verify LDR compliance for the saltcrete. HNUS has some additional analytical data for the saltcrete, that could be used to independently verify the data, but was not required to be supplied under their contract. This data is available, but will require a contract modification. The data that has been evaluated by EG&G verifies that a substantial portion (95%) of the saltcrete is LDR compliant, but there are barriers to using the data to certify the saltcrete for disposal purposes. In order to certify the waste for disposal, a disposal site certified laboratory must perform additional analysis. The laboratories which performed the HNUS analytical work were neither on the approved supplier list for the Nevada Test Site, nor were they a Utah certified lab, which is required for disposal at Envirocare, a candidate site for the disposal of saltcrete.

CDH stated that it is important that discussions regarding the status of potential waste disposal at Envirocare continue throughout the Federal Facility Compliance Act (FFC Act) process. RFO responded that at future LDR FFCA II Project Manager's meetings the RFP draft work plan for Envirocare could be discussed.

- *PROPOSED SAMPLING & ANALYSIS STRATEGY FOR EVAPORATOR SALTS AND NEWLY GENERATED SALTCRETE* - M. Connell, EG&G, discussed the proposed sampling and analysis of evaporator brine and salts, which are later solidified into saltcrete, and newly generated saltcrete. The purpose of the sampling and analysis strategy is to determine what analytes may be present to interfere with

² U.S. Department of Energy, "TRUPACT-II Content Codes (TRUCON)," Revision 4, DOE/WIPP 89-004, U.S. Department of Energy, WIPP Project Office, Carlsbad, New Mexico, July 1989.

cement chemistry and to determine what constituents are of concern for LDR compliance. D. Weier, EG&G Technology Development, presented the statistical sampling approach proposed for use to verify LDR compliance for the newly generated saltcrete waste form (Attachment 7). The general approach involves an initial flurry of activity in the first two production runs (4 saltcrete samples per run) from each tank of brine to verify LDR compliance (assuming 8 production runs per brine tank). Subsequent production runs from the same tank of brine would be sampled in an ongoing monitoring process at the rate of 1 sample for every 2 production runs. These samples would be analyzed to demonstrate that the process remains unchanged. Current plans involve sampling of both the brine and the saltcrete product. CDH inquired if the source of cadmium detected in the brine was known. E. Garcia, EG&G, is currently tasked with examining all the inputs to Building 374 to determine the real waste codes classification of each waste stream and to pinpoint the source of the cadmium contamination. CDH noted that if a tank of F006 sludge could be located and stopped prior to being sent to Building 374, this could potentially solve the problem.

CDH expressed an interest in getting all the waste characterization organizations at RFP to communicate. There seems to be several organizations going through seemingly different thought processes to achieve waste characterization. S. Anderson, EG&G, remarked that the Waste Identification and Characterization (WIC) organization is the central point of contact for all RFP waste characterization activities. CDH stated that from their perspective, a cohesive or well coordinated waste characterization effort is not evident. CDH recommended a meeting with representatives from all of the functional organizations at RFP involved in waste characterization and the regulators to discuss a coordinated approach for waste characterization and analysis activities conducted at RFP. The type of waste characterization program and routine sampling and analysis program would support the requirements of waste analysis stipulated in 40 CFR 265.13³. CDH reiterated that a consistent approach must be utilized across plant site, and that routine sampling approaches must be developed with a central point of contact to inform all of the affected organizations. This type of waste characterization approach needs to be established for each treatment unit or waste stream on plant site. EG&G agreed to set up a meeting as suggested.

OTHER DISCUSSION - ROASTER OXIDE SAMPLING ACTIVITIES UPDATE - S. Day, EG&G, discussed the results of sampling activities that have taken place for the Roaster Oxide waste form. Four drums were sampled with the fourth drum discovered to contain a sludge-like material that was clearly mislabeled and not uranium oxide chips. Sampling activities for the remaining unopened roaster oxide sample drums immediately ceased due to safety concerns. A review of the existing RFP process

³ See 40 CFR, Section 265.13, General Waste Analysis

knowledge documentation and subsequent interviews conducted with plant personnel revealed that approximately 80 drums of waste mislabeled as Roaster Oxide contained a uranium contaminated sludge generated from Buildings 883 and 865. Current data that has not yet been validated indicates non-detects for organic compounds. The next steps for this waste population involve analysis for metals, and potentially the assignment a new IDC for internal RFP control. EPA remarked that the roaster oxide sampling event was a positive demonstration of waste characterization progress and strongly encouraged RFP to continue with this type of approach to uncover other subpopulations in RFP mixed waste forms.

REORGANIZATION OF DOE-RFO - R. DiSalvo, RFO, briefly described the current reorganization of DOE, RFO for the regulatory agencies. Reg Tyler has been reassigned to Solid Residues for the TRM Waste Management Division, Rick DiSalvo will be participating in the renegotiation of the Interagency Agreement (IAG), Bill Prymack will become the new EM-30 representative for FFCA Programs, and Sherri Rudolph will be the new Technical Program Officer (TPO) representing EM-50, Technology Development. RFO noted that a letter naming a new project manager to replace Reg Tyler will be transmitted to CDH and EPA shortly.

UPDATE ON THE FFC ACT - F. Dowsett, CDH, discussed the meetings held recently between the States regarding the FFC Act process. CDH attended a meeting last month in Dallas between the States regarding the terms of consultations required for potential offsite treatment. Only Idaho National Engineering Laboratory (INEL) is at the same level of understanding as RFO regarding the waste management issues involved. Disposal facility WAC is an important item to all the States involved with the FFC Act process. Many states are reluctant to permit treatment facilities if the disposal WAC is unknown and the LDR compliant waste form resulting from newly permitted treatment processes may not ever be shipped offsite for disposal. To this end, it has become evident that NTS needs a Waste Analysis Plan that is consistent with the waste forms to be shipped. Reliable and accurate waste characterization is the biggest issue to all of the states. CDH representatives indicated that both Colorado and Nevada recognize that process knowledge is usually sufficient for disposal at NTS if it is defensible and well documented. They did indicate a hesitancy to confirm that RFP process knowledge would be acceptable (especially in light of the roaster oxide sampling discovery of a subpopulation). Discussions were held regarding how the disposal issue fits into the FFC Act process. One common feature that all of the States have for enforcement will apply to the final waste form after treatment. The waste forms must meet waste acceptance criteria, and must be suitable for long term on-site storage if a disposal site is not available. All of the States agree that the disposition of the final waste form must be addressed in the Final Site Treatment Plan and in the Site Treatment Plan Compliance Order. EPA noted that some overlap of jurisdiction may occur between disposal issues resolved under the IAG process and those arising from the FFC Act process.

ADJOURNMENT

The meeting adjourned at 3:55 p.m.

Next meeting: 1:00 p.m.
Thursday, March 10, 1994

Location: Third Floor Conference Room
EG&G Rocky Flats, Inc.
Building 051, Denver West

Action Items:

1. Briefing on activities to gain approval to use Envirocare disposal site at next meeting.
2. EG&G to set up meeting to brief parties regarding characterization coordination at RFP.
3. RFO transmit letter naming new Project Manager.

LDR FFCA-II PROJECT MANAGER'S MEETING ATTENDANCE ROSTER

MEETING LOCATION: 3rd Flr. Conf Rm., Denver West

TIME: 1:00 p.m.

DATE: Feb. 10, 1994

ATTENDEE	ORGANIZATION	PHONE NUMBER
KICK DiSALVO	RFD WMD	966-4765
Ernest C. Garcia	EGG TD	966-5980
Michael Brumell	EG&G TD/WP	966-6053
DAVE PHILLIPS	EG&G TD	966-7104
LENT A. DORR	EGG FPM	966-6034
BOB KARLSSON	SAIC/EM-323	526-2696
Denny Weier	EG&G Stat Apps	966-4194
Scott Moya	EG&G FFCA Programs	273-6027
JOE MCKAIG	EG&G FFCA PROG	6531 P 4038
Scott Moya	EG&G FFCA	273-6027
John Alcott	CDH - HMWMD	692-3349
Dave Maxwell	EPA	294-1082
Fred Dewitt	CDH - HMWMD	692-3342
Reg Tyle	RFD - TWRD	966-5927
Tim McKEOWN	EG&G FFCA PROGRAMS	273-6148
Sherril Rudolph	RFD/AMOWM/TPO	
Sandy Day	FFCA Programs	273-6012
ROBIN SWEENEY	USDOE - Headquarters	301/903-7991
PAT ARNOLD	EG&G, RWP	966-2056
G. A. O'LEARY	EG&G, RWP	966-3268
JEFF D. Asmus	S.M. Stoller Corp.	449-7220 x426

LDR FFCA
MONTHLY PROJECT MANAGER'S MEETING

Thursday, February 10, 1994

Third Floor Conference Room
Building 051, Denver West
EG&G Rocky Flats, Inc.

1:00 p.m.

-
1. Actions from January LDR FFCA II Project Manager's Meeting
 - Status of CTMP Treatment System 6 - Solar Pond Cleanout
 - TRU-Mixed (TRM) Waste Characterization - Gas Generation Studies
 - Listing of TRM Item Description Codes (IDCs) which have been submitted for approval to the TRUCON document
 2. Waste Characterization
 - Backlog Saltcrete Recharacterization Information
 - Proposed Sampling & Analysis Strategy for Evaporator Salts and Newly Generated Saltcrete
 3. Other Discussion
 - Roaster Oxide Sampling Activities Update

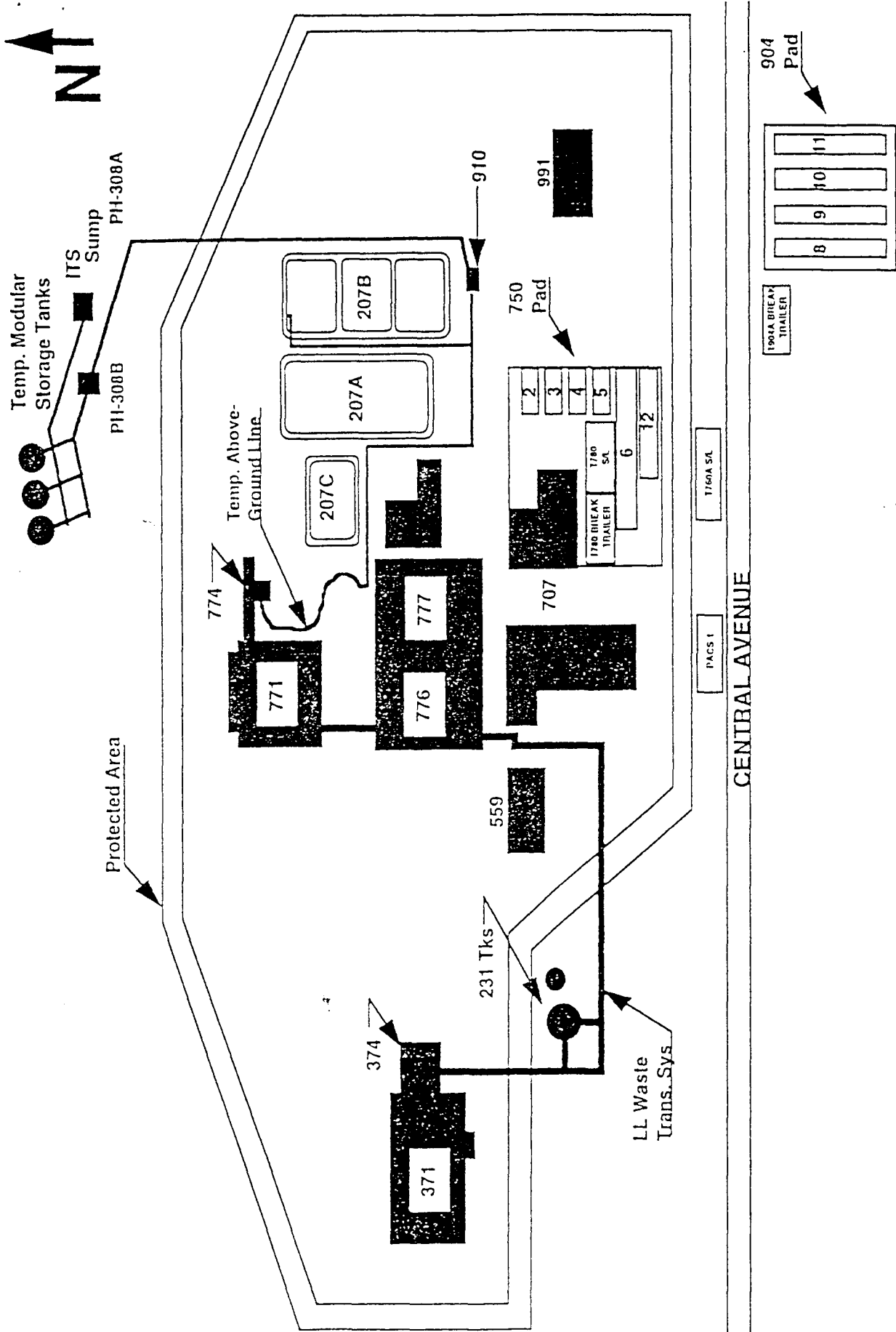
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SOLAR POND PROCESSING STATUS

FEBRUARY 10, 1994

**D. R. FERRIER
SOLAR POND PROJECTS**

SOLAR PONDS FACILITIES



2/10/94
Ferrier X8568

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Pond Sludge Samples Exceeding LDR Standards

POND	CONSTITUENT	LDR STANDARD (ug/l)	POND SLUDGE TCLP EXTRACT CONCENTRATION (ug/l)	SAMPLE NUMBER
207 A	Cadmium	66 CCWE	485	PS207A-NE
207 B-North	Cadmium	66 CCWE	67	PS207BN-NW
			104	PS207BN-SE
			67	PS207BN-SW
207 B-Center	Cadmium	66 CCWE	153	PS207BC-NE
			143	PS207BC-NW
			133	PS207BC-SE
207 B-South	None		114	PS207BC-SW
207 C	Cadmium	66 CCWE	945	PS207C-C
			5230	PS207C-CB
			475	PS207C-NW
			342	PS207C-NW-D
			444	PS207C-SW
			840	PS207C-C
			2140	PS207C-CB
			563	PS207C-NW
			624	PS207C-NW-D
	Nickel	320 CCWE	765	PS207C-SW
Clarifier			14,800	CS-001
			17,400	CS-001-D
			25,900	CS-002
			24,500	CS-003
	Cadmium	66 CCWE	7010	CS-001
			6990	CS-001-D
			8300	CS-002
	Nickel	320 CCWE	7300	CS-003

LDR - Land Disposal Restrictions, 40 CFR, Part 268

Pondcrete Samples Exceeding LDR Standards

Pondcrete Population	Analyte	LDR Standard	Frequency	Mean Concentration	Upper Limit of 80 % Confidence Interval	Contaminant Present at Level Exceeding LDR Standard
Metals	Methanol - TCLP	15 mg/kg (2)	11/42	15.4 mg/kg	(3)	(4)
	Cadmium - TCLP	66 ug/l (CCWE)	29/40	10,800 ug/l	(3)	Yes
	Nickel - TCLP	320 ug/l (CCWE)	24/40	920 ug/l	(3)	Yes
	Chromium - TCLP	5200 ug/l (CCWE)	3/40	1520 ug/l	1850 ug/l	No
Triwalls	Cadmium - TCLP	66 ug/l (CCWE)	14/16	20,600 ug/l	(3)	Yes
	Nickel - TCLP	320 ug/l (CCWE)	14/16	2,460 ug/l	(3)	Yes
	Chromium - TCLP	5200 ug/l (CCWE)	10/16	5,290 ug/l	(3)	Yes
	Amenable Cyanide	30 mg/kg (CCW)	1/17	3.7 mg/kg (5)	6.1 mg/kg (5)	No

CCW - Contaminant Concentration in Waste.

CCWE - Contaminant Concentration in Waste Extract.

(1) Following procedure outlined in Chapter 9 of SW-846.

(2) Calculated value represents minimum concentration in waste that could produce a TCLP leachate concentration exceeding the LDR Standard of 750 ug/l. See calculation in Appendix G.

(3) Mean is already greater than LDR Standard.

(4) Contaminant is present at a concentration that, when leached, might result in the leachate concentration exceeding the LDR Standard.

(5) Negative values assumed to be zero.

Saltcrete Samples Exceeding LDR Standards

Saltcrete Population	Analyte	LDR Standard	Frequency	Mean Concentration	Upper Limit of 80 % Confidence Interval (1)	Contaminant Present at Level Exceeding LDR Standard (1)
Half Crates	Cyanide-Amenable	30 mg/kg (CCW)	2/13	12.9 (2)	20.2 (2)	No
Metals	Cadmium - TCLP	66 ug/l (CCWE)	2/6	40.9	77.4	Yes
	Nickel - TCLP	320 ug/l (CCWE)	2/6	713.8	(3)	Yes
	Silver - TCLP	72 ug/l (CCWE)	2/2	130.5	(3)	Yes
Triwalls	Cadmium - TCLP	66 ug/l (CCWE)	3/42	16.9	21.9	No
	Nickel - TCLP	320 ug/l (CCWE)	7/42	208.7	248	No
	Silver - TCLP	72 ug/l (CCWE)	5/42	19.6	26.7	No

CCW - Contaminant Concentration in Waste.
 CCWE - Contaminant Concentration in Waste Extract.
 (1) Following procedure outlined in Chapter 9 of SW-846.
 (2) Negative values assumed to be zero.
 (3) Mean is already greater than LDR standard.

TREATABILITY STUDY STATUS

- **PONDSLUDGE**

- 207 C and Clarifier and 207 A&B completed
- Type V Portland cement , Type C flyash, Lime in Ratio 1.0/2.0/0.075
- Water to pozzolan ratio 0.34 to 0.50 target value 0.42
- Passes ASTM D4359-84 and SW846, Method 9095 (Free liquid)

- **BACKLOG PONDCRETE AND SALTCRETE**

- Currently in procurement process to complete in Fall 1994
- Objectives:
 - » Determine formula
 - » Ascertain nature of material and impact on process options

SLUDGE PROCESSING AND REMIX

- Current estimate to complete - \$135.1M
 - Changes from March 1993
 - » Location of sludge
 - » Real estate available
 - » Schedule requirements
 - » Emphasis on site remediation over waste processing
 - » Permanent disposal site not available
 - » Graded approach to Readiness Assessment
 - » Clean process equipment for next user in lieu of demobilization

SLUDGE PROCESSING AND REMIX

- Current strategy
 - Use one location, outside Protected Area, for processing
 - Minimum mods to basic processing train for each waste stream
 - Limit to commercially available equipment (no leased equipment)
 - Utilize plant power (eliminates generators)
 - Provide for year-round operations at lower unit rate
 - Establish decision hold points for key issues such as repository available
 - Investigate cost/benefits of smaller crushing systems and alternate trash handling in remix
 - Optimize through put requirements for costs rather than schedule
 - Utilize fixed price construction for process train
 - Potential to utilize same central process facility for other plant waste streams (customize if required)
 - Investigate alternative technologies to cementation (vitrification, polymers, flyash)


Activity	Start Date	End Date	Duration	Days	1994	1995	1996	1997	1998	1999	2000	2001	2002
WASTE TREATMENT, STORAGE & DISPOSAL													
12150-WASTE TREATMENT													
1215000010 NEW CDR & DES CRITERIA	30 OCT 94	2 JAN 96	307	307									
1215000020 NO 2		2 JUN 96	0	0									
1215000030 PERMIT NEW AREA	3 JUN 96	1 JUL 96	127	127									
1215000040 REVISE TITLE II DESIGN - C-POND	3 JUN 96	15 NOV 96	224	224									
1215000050 NEPA (FOR ALL PHASES)	3 JUN 96	15 NOV 96	159	159									
1215000065 NO 3		15 NOV 96	0	0									
1215000070 CONSTR. & TITLE III (C-POND) NEW TENTS, PAD INCL.	18 NOV 96	30 JUL 97	172	172									
1215000080 INHS EQUIPMENT LEASE (C-POND SPECIFIC IF ANY)	18 NOV 97	30 SEP 98	344	344									
1215000090 PROC, OPS PLNG, TEST PLNG, TRAINING, REPOS ADULT, ETC	18 NOV 96	30 JUL 97	172	172									
1215000100 SO TEST/DEBUC/READINESS ASSESSMENT	31 JUL 97	18 DEC 97	85	85									
1215000110 NO 4		18 DEC 97	0	0									
1215000120 OPERATE (HOT TEST FIRST)	28 DEC 97	30 JUL 98	164	164									
1215000130 RE-VISIT/FINALIZE TREAT STUDY	3 JUN 95	31 MAR 96	64	64									
1215000140 TITLE II DESIGN (B-POND)	18 NOV 96	30 JUN 97	151	151									
1215000150 NO 2		30 JUN 97	0	0									
1215000160 CONSTRUCTION & TITLE III (B-POND MODIFICATION)	1 APR 98	30 NOV 98	169	169									
1215000170 PROC, OPS PLNG, TEST PLNG, TRAINING, ETC	28 APR 98	30 NOV 98	190	190									
1215000180 SO TEST/DEBUC/READINESS ASSESSMENT	18 DEC 98	15 JAN 99	28	28									
1215000190 NO 4		15 JAN 99	0	0									
1215000200 OPERATE (HOT TEST/VALIDATION FIRST)	18 JAN 99	15 JUL 99	126	126									
1215000210 TREATABILITY PHASE I	25 SEP 94	30 MAY 95	314	314									
1215000220 TITLE II - RENIX	24 JUN 97	31 MAR 98	193	193									
1215000230 TREATABILITY PHASE II	10 OCT 96	2 JAN 98	399	399									
1215000240 NO 3		21 MAR 98	0	0									
1215000250 CONSTRUCTION & TITLE III	11 APR 98	3 JAN 00	436	436									
1215000260 PROC, OPS PLNG, TEST PLNG, TRAINING, ETC	21 SEP 98	30 JUN 99	193	193									
1215000270 SO TEST/DEBUC/READINESS ASSESSMENT	16 JUL 99	31 MAR 00	176	176									
1215000280 NO 4		31 MAR 00	0	0									
1215000290 OPERATE (HOT TEST/VALIDATION FIRST)	31 MAR 00	1 APR 02	497	497									
1215000300 PROCESS TRAIN CLEAN-UP	28 MAR 02	25 JUN 02	60	60									
12152-WASTE DISPOSAL													
1215200010 WASTE DISPOSAL	28 FEB 98	30 MAR 98	1058	1058									
1215200020 DELISTING (POND SOURCE)	4 APR 94	22 AUG 96	661	661									
1215200030 DELISTING (RENIX)	1 NOV 94	18 NOV 97	760	760									
12153-WASTE STORAGE													
1215300010 WASTE STORAGE	10 OCT 99	25 JUN 02	2172	2105									
LEG ROCKY FLATS													
OPERABLE UNIT 104													
SOLID POND5 FRACTION SURFACED W/O DIL													
Start Date	1994	1995	1996	1997	1998	1999	2000	2001	2002				
Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity				
Project Start	Project Start	Project Start	Project Start	Project Start	Project Start	Project Start	Project Start	Project Start	Project Start				
Project End	Project End	Project End	Project End	Project End	Project End	Project End	Project End	Project End	Project End				

GAS GENERATION MEASUREMENT PROGRAM

**Pat Arnold
Kyle Peter**

February 10, 1994

February 10, 1994

 **EG&G ROCKY FLATS**

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Gas Generation Measurement

- TRUPACT-II Safety Analysis Report (SAR) Requirements
 - < 5% hydrogen in any layer of confinement
 - < 50 PSI in the TRUPACT
- Controls on TRUPACT-II Payload
 - 1) Waste material type - and associated G-value
 - 2) Number of layers of packaging
 - 3) Decay heat
- Engineering Analysis Performed Using Above Parameters to Determine:
 - Analytical Category
 - Test Category

Gas Generation Measurement (cont.)

Waste Types	Analytical	Test
I - Solidified Aqueous	Yes	If Needed
II - Solid Inorganics	Yes	If Needed
III - Solid Organics	Yes	If Needed
IV - Solidified Organics	No	Yes

Table 1.2.3.3.1

Analytical Shipping Category Wattage Limit Per Drum (Watts/Drum)

Waste Material Type	A-Drum						
	A0	A1	A2a	A2	A3	A4	A5
I.1	0.2060	0.1797		0.1594	0.0466		
I.2	0.2536	0.2212		0.1962	0.0573	0.0418	
I.3	0.8241	0.7189		0.6375	0.1863	0.1359	
II.1	0.2251	0.1924	0.1680	0.0869	0.0561	0.0414	0.0328
II.2							40.0000
III.1	0.1126	0.0962	0.0840	0.0434	0.0280	0.0207	0.0164

Gas Generation Measurement (cont.)

- Procedure Specified in TRUPACT-II SAR
 - Filtered Waste Drums meeting all certification requirements
 - Equipment configuration
 - Test at TRUPACT-II temperature of 135-146 degrees F
 - Measure off-gas flow
 - Sample and analyze for composition
- Plan to Revise Procedure/Equipment and Receive NRC Approval
- Five Drum Setup of Original Configuration

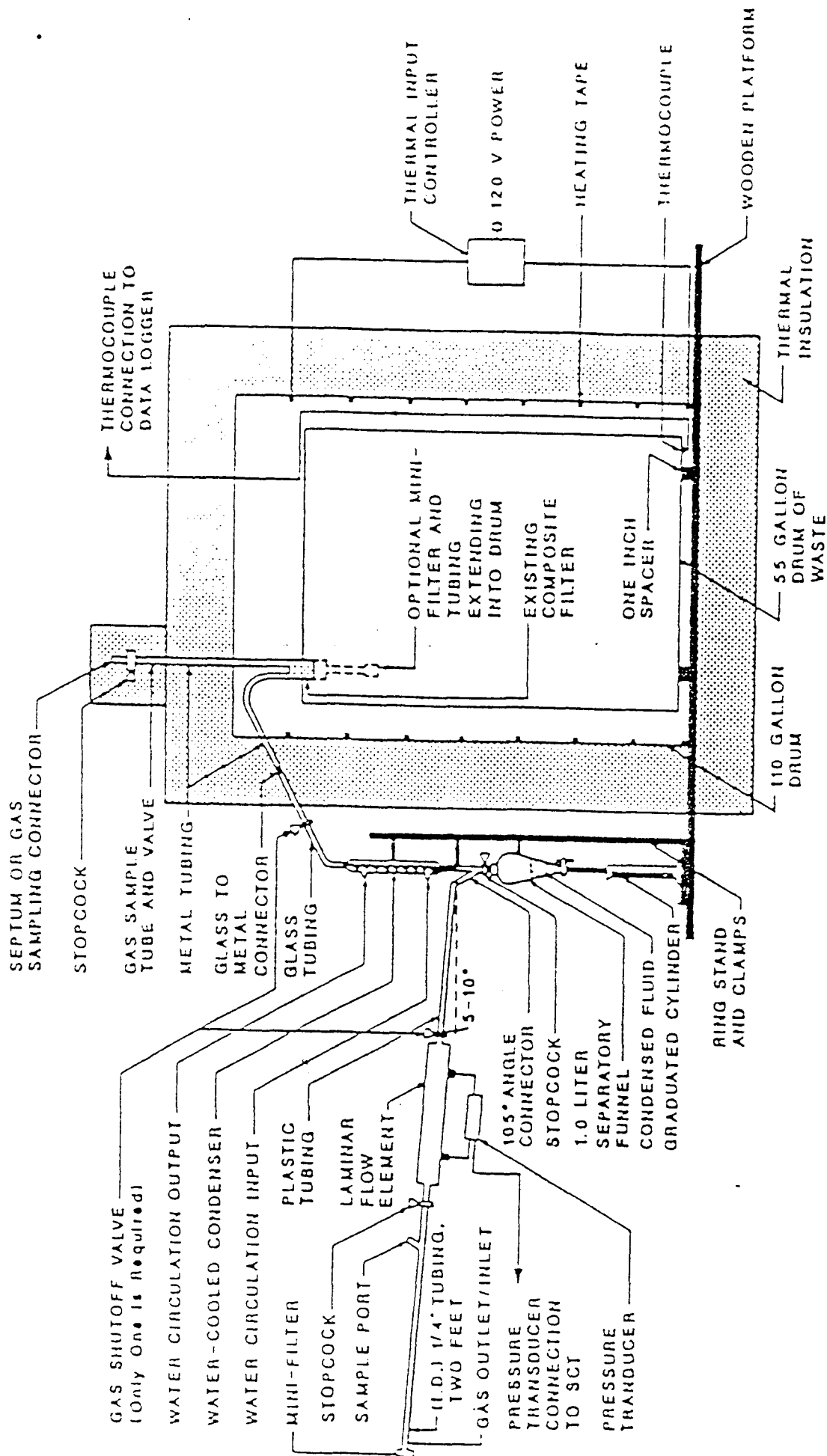


FIGURE 1. SCHEMATIC OF TEST EQUIPMENT FOR 55 GALLON DRUM
(NOT TO SCALE)

Does Gas Measurement Require Treatment Permit Under RCRA?

- Excluded Under Section 261.4(d) CHWR
 - Sample of solid waste for the sole purpose of testing to determine its characteristics or composition
- Not Treatment as Defined Under 260.10 CHWR
 - is not a method, technique, or process designed to change the physical chemical or biological character or composition of a hazardous waste
- Purpose of Gas Measurement
 - to determine gas generation characteristics
 - to qualify drums for shipment in TRUPACT-II
 - not designed to change the character or composition of the waste

GAS GENERATION MEASUREMENT PROGRAM

INTRODUCTION

Shipments of transuranic (TRU) or TRU-mixed (TRM) waste destined for the Waste Isolation Pilot Plant (WIPP) must be made in a Nuclear Regulatory Commission (NRC) approved Type B package. The TRUPACT-II vessel has been issued an NRC Certificate of Compliance (C of C) as a Type B package to transport waste that meets the transportation criteria established in the "application" for the C of C, which is the "Safety Analysis Report (SAR) for the TRUPACT-II Shipping Package, Docket Number 71-9218" (TRUPACT-II SAR). One of the major concerns of the NRC in evaluating the TRUPACT-II package for certification was the radiolytic generation of gases, particularly hydrogen, in the worst case 60-day shipping period. To control the gas concentrations and pressure, restrictions were placed in the TRUPACT-II SAR on the: 1) waste material type, 2) number of layers of packaging within each payload container (drum or box), and 3) decay heat within each payload container. Based on these three criteria, waste is placed into one of two categories, analytical or test, based on the hydrogen generation potential.

WASTE CATEGORIES

For waste that is in the analytical category, an engineering analysis was performed by the U. S. Department of Energy (DOE)-Waste Isolation Pilot Plant (WIPP) in the TRUPACT-II SAR to show that the hydrogen concentration would remain below the five volume percent limit established. These theoretical worst case calculations were performed to determine which waste containers could be shown to meet the shipping criteria limit on hydrogen concentration based on existing gas generation and other data. That is, the container wattage, number of layers of confinement, and waste type with the associated gas generation rate are well known and will provide assurance that the hydrogen concentration will remain within acceptable limits for the shipping period. The gas generation rate is usually expressed as a G-value which is a measure of gas production per absorbed radiation dose.

On the other hand, test category waste is placed in that category for one of two reasons: 1) for waste with known G-values, the waste exceeds established wattage limits for the waste type and number of layers of confinement, or 2) for certain waste types wattage limits cannot be established because a G-value has not been well established to allow a worst case gas generation calculation to be performed. Waste without an established G-value or wattage limit is referred to as Type IV waste in the TRUPACT-II SAR. To allow shipment of these containers, the gas generation under worst case shipping conditions must be measured to show that they can be transported in the TRUPACT-II. Alternately, for waste that exceeds the established wattage limits, the waste could be repackaged into multiple containers or fewer packaging layers to meet the wattage limits. Once enough data are compiled to establish G-values for Type IV waste or to establish more realistic, non-worst case G-values for waste exceeding the wattage limits, this waste may be shipped without the need to measure gas generation from each drum. Until G-values for Type IV waste are established, measurement of each drum is the only method that will allow shipment of the waste in TRUPACT-II. The following table indicates the differences between the test and analytical categories.

Waste Type	Waste Description	Analytical Category	Test Category
I	Solidified Aqueous/ Homogeneous Inorganic Solids	Yes	If over wattage limits
II	Solid Inorganics	Yes	If over wattage limits
III	Solid Organics	Yes	If over wattage limits
IV	Solidified Organics	No	Yes

GAS GENERATION MEASUREMENT

The procedure for determining gas generation is prescribed in the TRUPACT-II SAR, but is being modified to reflect equipment improvements and will require approval by the NRC. The determination of gas generation involves simulating the thermal conditions modeled in the TRUPACT-II SAR for the expected worst case shipping period of up to 60 days. The thermal conditions vary according to waste type: from 135° F for Waste Type IV to 146° F for Waste Types II and III.

Gas measurement will be conducted on 55-gallon drums that meet all other shipping and waste acceptance criteria. The drums will be otherwise ready for shipment including having the internal liner bags sealed and the standard filtered drum lid installed. A drum will be loaded into one of five 110-gallon drums that is heat traced and insulated to control the temperature as prescribed in the TRUPACT-II SAR. A sampling manifold will be installed over the existing filter in the 55-gallon drum lid. The sampling manifold will be open to the room atmosphere and will be equipped with a precision flow meter to measure any gas generation or gas consumption. The manifold also will have a sample port to collect gas samples in evacuated stainless steel bottles. The samples will be analyzed to determine the hydrogen composition and those results will be combined with the flow rate information to determine total hydrogen generation.

PERMITTING

The above described measurement program should not require permitting under the Resource Conservation and Recovery Act (RCRA) for the following reasons. Section 261.4(d) of the Colorado Hazardous Waste Regulations (CHWR) allows for an exclusion from permitting requirements for a sample of solid waste or a sample of water, soil, or air, which is collected for the sole purpose of testing to determine its characteristics or composition. The purpose of the TRUPACT-II gas generation testing is to determine the gas generation characteristics of various waste forms and to qualify those and future drums for shipment in the TRUPACT-II.

Also, the gas generation measurement program does not meet the definition of treatment under Section 260.10 of CHWR as "any method, technique, or process designed to change the physical, chemical or biological character or composition of a hazardous waste." The program is not designed to change the character or composition of the waste, but rather to measure any gas generation to allow shipment in TRUPACT-II. Therefore, the Rocky Flats Plant (RFP) feels that the described gas generation measurement program does not require permitting under RCRA. Mr. Dowsett of CDH agreed, in the Land Disposal Restricted (LDR)-Federal Facility Compliance Agreement (FFCA) monthly project manager's meeting, February 10, 1994, that the gas generation measurement program does not meet the definition of treatment.

TRUCON STATUS OF IDC'S

IDC	DESCRIPTION	ASSIGNED TRUCON	TRUCON SUBMITTED	NO TRUCON
0292	Incinerator sludge			*
0299	Miscellaneous sludge			*
0300	Graphite molds	RF115A		
0301	Classified graphite shapes			*
0302	Benelex & plexiglass	RF121A		
0303	Scarfed graphite chunks	RF115A		
0312	Graphite, coarse	RF115A		
0320	Heavy non-SS metal	RF117A		
0321	Lead	RF117A		
0328	Filters, Ful-Flo, incinerator			*
0330	Combustibles, dry			•
0331	Filters, Ful-Flo, not incinerator			•
0335	Absolute drybox filters, not acid contaminated	RF119A		
0336	Combustibles, wet			•
0337	Plastic			•
0338	Filter media	RF119A		
0339	Leaded drybox gloves, not acid contaminated	RF123A		
0341	Leaded drybox gloves, acid contaminated			•
0342	Absolute drybox filters, acid contaminated	RF119A		
0368	Mg oxide ceramic crucibles, not LECO	RF118A		
0370	LECO crucibles	RF118A		
0372	Grit			*
0374	Blacktop, concrete, dirt, sand	RF121A		
0375	Oil dry	RF122A		
0376	Processed filter media	RF119A		
0377	Fire brick, coarse	RF122A		
0378	Fire brick, pulverized or fine			*
0391	Unpulverized sand & crucible			*
0392	Unpulverized sand, slag & crucible			*
0393	Sand, slag & crucible heel			*
0398	Pulverized sand, slag & crucible			*
0409	Molten salt 30% pulverized			*
0411	Electrorefining salt, final disposition	RF124A		
0412	Gibson salt			*
0414	DOR salt unoxidized Ca			*
0420	Pulverized incinerator ash			*
0425	Fluid-bed ash			*
0430	Resin, unleached			•
0431	Resin, leached			*
0438	Insulation	RF122A		
0440	Glass (except raschig rings)	RF118A		
0441	Unleached raschig rings		RF118A	•
0442	Leached raschig rings	RF118A		

TRUCON STATUS OF IDC'S

IDC	DESCRIPTION	ASSIGNED	TRUCON	
		TRUCON	SUBMITTED	NO TRUCON
0444	Ground glass	RF118A		
0479	Empty reusable cans in drum			*
0480	Light metal	RF117A		
0481	Light non-SS metal prepared for leach			*
0484	Classified non-NM, non-Be scrap metal shapes			*
0485	Scrap D-38 classified shapes			*
0486	Classified tooling for disposal			*
0487	Classified plastic shapes			*
0489	Classified Be scrap metal shapes			*
0490	HEPA filters, not acid contaminated	RF119A		
0491	Plenum pre-filter	RF119A		
0492	HEPA filters, acid contaminated			•
0800	Solidified sludge, Bldg. 774	RF111A		
0801	Solidified organics, Bldg. 774	RF112A		
0802	Solidified lab waste, Bldg. 774	RF112A		
0803	Cemented process solids	RF113A		
0807	Solidified bypass sludge, Bldg. 374	RF111A		
0821	Combustibles, dry TRU waste		RF116A	•
0822	Combustibles, wet TRU waste		RF116A	*
0823	Cemented miscellaneous sludge			*
0824	Light metal TRU waste		RF117A	*
0825	Plastic TRU waste			*
0831	Combustible dry TRU-mixed waste	RF116A		
0832	Combustible wet TRU-mixed waste	RF116A		
0833	Plastic TRU-mixed waste	RF116A		
0855	Ground glass			*
0856	Raschig rings, solvent contaminated		RF118A	*
2116	Supercompacted TRU-mixed combustibles		RF116C	*
2117	Supercompacted TRU-mixed light metal		RF117C	*
2118	Supercompacted TRU-mixed glass waste		RF118C	*
2216	Supercompacted TRU combustibles		RF116C	*
2218	Supercompacted TRU glass waste		RF118C	•
2219	Supercompacted TRU processed filter media		RF119C	

EVALUATION OF SALTCRETE ANALYTICAL DATA GENERATED BY HALLIBURTON NUS
ENVIRONMENTAL CORPORATION

PRESENTATION OUTLINE

Task

Review the Halliburton saltcrete analytical data report and other relevant documents to confirm critical elements of data acceptance have been addressed and are acceptable.

Task Goal

Use the Halliburton saltcrete analytical data to verify compliance with the Land Disposal Restrictions (LDR) Treatment Standards.

Saltcrete Description

Saltcrete is produced by solidifying a multi-component inorganic waste salt with hydrated cement. The salt is the product of thermal/vacuum concentration of the low level aqueous waste streams generated at the Rocky Flats Plant (RFP).

Data Acquisition History

Halliburton Environmental Technologies was awarded a sub-contract titled Solarpond/Pondcrete Waste Removal. At a later date a decision was made to reprocess all of the inventoried saltcrete and to include this work in the sub-contract. As a integral part of Deliverable 224C Halliburton NUS Environmental Services (Halliburton NUS) produced a statistically designed Sampling and Analysis Plan. A specific goal of the plan was to "evaluate the compatibility of the saltcrete population to support any design options that include saltcrete consolidation". The plan was implemented and the resulting data was incorporated in a document entitled Saltcrete Waste Characterization Report (Deliverable 224C).

Discussion

A review of the report which included the sampling field log book led to the conclusion that the saltcrete inventory, with the exception of the saltcrete stored in metal containers would be compliant with the LDR treatment standards. A more critical review of the data ensued specifically addressing the waste acceptance criteria of the proposed disposal sites as well as the requirements imposed by EG&G Rocky Flats, namely the provisions of the level one document "Control of Purchased Items and Services" (1-50000-ADM-04.01). Several deficiencies were noted. The deficiencies are as follows:

1. The data has not been validated by an independent validation service (EG&G sub-contractor).
2. The Halliburton report does not contain sufficient data to perform a validation.

3. The Halliburton laboratory providing the analytical data is not included in the EG&G Approved Supplier List.
4. The Halliburton laboratory providing the data is not included in the State of Utah, Bureau of Laboratory Improvement "List of Certified Laboratories"(Envirocare waste acceptance criteria).

These deficiencies are addressed in the "Halliburton Saltcrete Data Evaluation" (TD94-002) report.

Conclusions

The Halliburton data can be employed to presume that the saltcrete inventory, with the exception of the waste stored in metal containers, produced prior to May 1991 does in fact meet the LDR treatment standards.

Recommendations

Declare that the following are compliant with the LDR treatment standards pending final verification from the proposed sampling and analytical activities:

1. A half-crate population of 713
2. A triwall population of 2662

Future Work

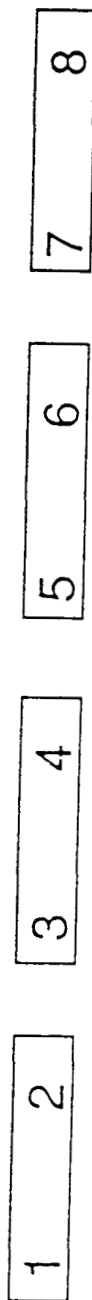
As alluded to in the Recommendations, the following are proposed for future consideration:

1. Prepare a sampling and analysis qualification plan to assure compliance with all applicable plant policies and regulatory requirements.
2. Prepare a statistically designed sampling and analysis plan for all of the inventoried (prior to March 1994) saltcrete, with the exception of the waste stored in metal containers.

Saltcrete Block Sampling

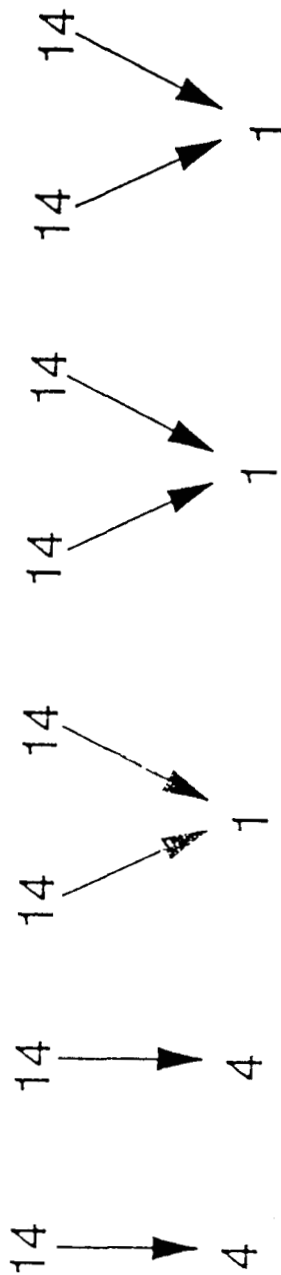
Brine
Tank
#1

Production Run



(rectangles represent shipments)


Number of
Blocks:



Number
Sampled:

Repeat same sampling activity

Brine
Tank
#2

 **EG&G ROCKY FLATS**

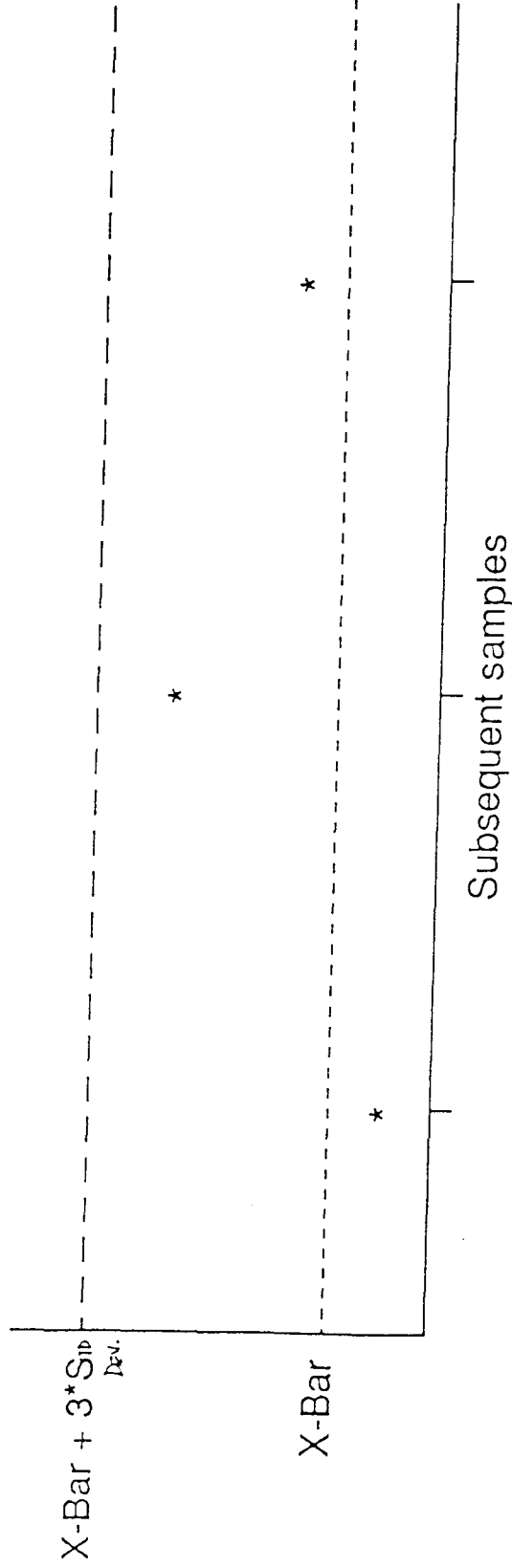
Saltcrete Block Sampling


First eight samples are used to verify LDR compliance:

EPA Guidelines (SW846): compute \bar{X} -Bar + $T \cdot S/\sqrt{n}$ and compare to regulatory standard.

First eight samples also provide control limit for ongoing monitoring:

Subsequent sample results are plotted to verify an unchanged process:



 **EG&G ROCKY FLATS**

Saltcrete Block Sampling

When subsequent sample results are less than the control limit:

- Waste treatment process is taken to be unchanged.
- Blocks are taken to be LDR compliant.
- Two associated production runs are cleared for shipment.

If a subsequent sample result for an analyte exceeds the control limit:

- Result is compared to the regulatory standard.
- Additional sampling is performed as appropriate:
 - Same core from same block.
 - Additional core(s) from same block.
 - Additional block(s).
- Arguments for LDR compliance are made.